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Rynchospora which I failed to recognize and which proved to be *R. rariflora*, a species not previously reported from north of North Carolina, so far as I can ascertain. This adds one more to the list of southern plants that have recently been brought to light in the southwestern portion of the Cape May peninsula.

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REVIEWS

Kellogg's Darwinism To-Day.*

This timely and welcome volume is intended "as a means of orientation in evolutionary matters for the general reader and for the unspecialized but interested student of science." The controversies instigated by the publication, in 1859, of Darwin's *Origin of Species*, have undoubtedly won complete victory, at least among scientists, for the theory of evolution; but strange as it may seem, these same controversies and the underlying investigations instigated by Darwin's work, have not resulted in establishing the validity of the particular method of evolution elaborated in the *Origin*. Quite to the contrary, as Kellogg says, "The fair truth is that the Darwinian selection theories, considered with regard to their claimed capacity to be an independently sufficient mechanical explanation of descent, stand to-day seriously discredited in the biological world." While several alternative and supplementary theories have been advanced, none of them has met with anything like a general acceptance, and Professor Kellogg well expresses our present *statu quo* when he says, "we are immensely unsettled."

In addition to winning the battle for evolution, by whatever method, the above-mentioned controversy has taught us the fundamental lesson that the question of method can never be settled by polemics, nor can the true process, or processes, ever be discovered in library or cloister, nor evolved out of our own inner consciousness. The recognition of this is a great step forward. The true method, or methods, of organic evolution

* Kellogg, Vernon L. *Darwinism To-Day*. Pp. xii + 403. Henry Holt & Co. New York. 1907.

can be ascertained only by observation and comparison of facts, the framing of hypotheses based upon those facts, and the deductive test of the hypotheses. Thus by a selection of hypotheses the fittest will survive. If Darwinism stands to-day seriously discredited as a sufficient causo-mechanical explanation of the fact of organic evolution, it is not on *a priori* grounds, nor because it is, as supposed by some, atheistic or at variance with the book of Genesis, but solely because, during the fifty years of its rigorous testing by application to fact, it has been found inadequate to explain all of the facts observed.

Not the least value of Professor Kellogg's book is its candid and, so far as space has permitted, adequate statement of both sides of the question, and of the other theories now struggling for recognition. Especially has the author rendered a service in putting Plate's arguments against natural selection into a form readily accessible to those who read German with difficulty, for Plate's work constitutes one of the strongest assaults against the Darwinian citadel.

On page 234, when the author says, "If, in a species, a number of individuals show a certain congenital variation, this variation will probably be lost by cross-breeding with individuals not having it, unless the individuals having it are in the majority or unless they become in some way isolated from the others so that they will breed among themselves," we are not sure from the context whether he is stating his own belief or merely the argument of the isolationists. In any event, there seems to be here a disregard of Mendelian light; and a treatment of the bearing of Mendelism on swamping by cross-breeding is not met with elsewhere in the book.

On page 330 the assertion, "Species-forming by sports and discontinuous variations is obviously (*sic*) no theory to presume to offer itself as a species-forming substitute for natural selection," seems strikingly intemperate in comparison with the treatment of other theories in the book. Not "obviously," by any means; and least so to those who have taken the pains to check up the results of field studies by experiments with pedigreed cultures. On page 377 the mutation-theory of de Vries seems to

the reviewer to be entirely misrepresented when it is said to "offer itself as an explanation of adaptation," and to be a "claimant for recognition as the great cause of descent." Unless I have entirely misunderstood de Vries, mutation was never put forward by him as an explanation of adaptation, nor as a "cause" of anything, but as a method only; the method of variation (by saltation) whose results are held most probably to furnish the material for natural selection (the great "sieve," as de Vries calls it) to act on. Adaptation, for the de Vriesian mutationist, as well as for the Darwinian, results from the survival of the fittest (because best adapted) in the struggle for existence. It were much nearer the truth to say that mutation offers an explanation for the lack of adaptation, *i. e.*, for the origin of characters that are not adaptive. It is on this point that the weakness of natural selection is greatly in evidence.

The last chapter is a kind of confession of faith, or scientific creed, of the author, in which he makes it more clear, if possible, than do the above quotations, that he is not a mutationist. "Darwinism," he says, "as the natural selection of the fit, the final arbiter in descent control, stands unscathed, clear and high above the obscuring cloud of battle. At least, so it seems to me. But Darwinism, as the all-sufficient or even the most important causomechanical factor in species-forming and hence as the sufficient explanation of descent, is discredited and cast down." The author urges us, "with Osborn," to "join the believers in the 'unknown factors in evolution,'" and inclines to a belief that there is "an automatic modifying principle which results in purposive change, that is, in the change needed as the indispensable basis for the upbuilding of the great fabric of species diversity and descent" (p. 387).

The reading of the book is rendered easier and more pleasant by the paragraph headings in heavy type, and less so by numerous lengthy quotations in German and French in the appendices to the chapters. The citations to original papers serve to render the book even more helpful and indispensable. All students of evolution-theories and kindred problems will warmly welcome it.

C. STUART GAGER.